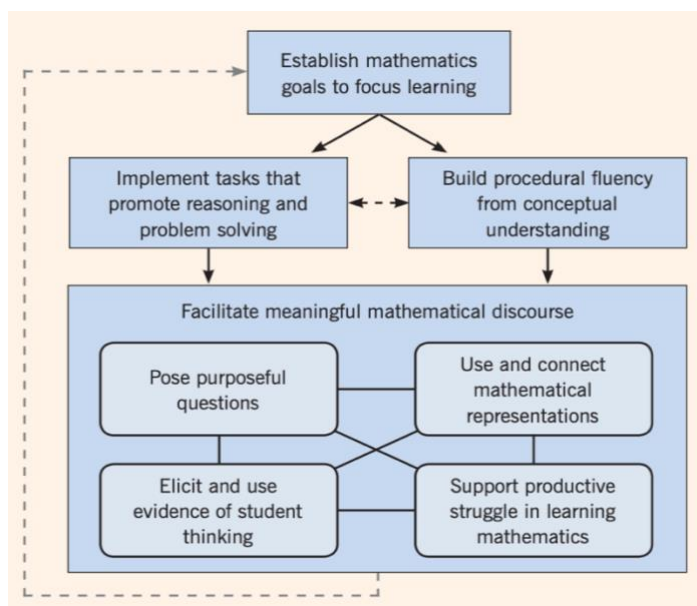


AR Math QuEST (Quantitative Essentials for Students and Teachers)

is a journey for ambitious teaching that promotes equity and engagement of all students in meaningful mathematics learning experiences of reasoning and problem solving. AR Math QuEST empowers educators and families to help students develop positive identities as doers of mathematics to increase student achievement.

The NCTM's Mathematics Teaching Practices and the Standards for Mathematical Practice are the research-based foundation for exemplary teaching and learning.

Mathematics Teaching Practices:



Standards for Mathematical Practices:

OVERARCHING HABITS OF MIND
1. Make sense of problems and persevere in solving them
6. Attend to precision

REASONING AND EXPLAINING

2. Reason abstractly and quantitatively
3. Construct viable arguments and critique the reasoning of others

MODELING AND USING TOOLS

4. Model with mathematics
5. Use appropriate tools strategically

SEEING STRUCTURE AND GENERALIZING

7. Look for and make use of structure
8. Look for and express regularity in repeated reasoning

AR Math QuEST professional learning experiences will adhere to the guidelines set forth in ESSA (2015), “sustained (not stand-alone, 1-day, or short-term workshops), intensive, collaborative, job-embedded, data-driven, and classroom-focused.”

Professional Development Plan for Educators

AR Math QuEST is a two-year, state-initiated professional development opportunity for mathematics educators grades K-12. Education service cooperatives throughout the state will host training for select district teams of grades 6-8 and high school (Algebra I/II, and Geometry) classroom teachers beginning Summer 2019 with expansion to K-5 in subsequent years. Instructional facilitators and administrators are highly encouraged to attend PD sessions with their district teams. PD will include whole group sessions along with grade-band breakouts. This structure allows for vertical collaboration as well as grade-band content focus, growth, and discussions. Participants will receive *Taking Action: Implementing the Effective Teaching Practices* for their appropriate grade band.

Year 1	Summer	2-day Face-to-face PD ¹
	Fall	2 days of job-embedded support ² 1-day Face-to-face PD in November ³
	Spring	2 days of job-embedded support ²
Year 2	Summer	2-day Face-to-face PD ⁴
	Fall	2 days of job-embedded support ² 1-day Face-to-face PD in November ³
	Spring	2 days of job-embedded support ²

¹ *AR Math QuEST PD: Introduction to Ambitious Teaching*

- NCTM Principles to Action
 - Equity and Access
 - Mathematical Identity, Productive/Unproductive Beliefs, Growth Mindset
- STEM Connections
- Overview of the Framework for Exemplary Teaching and Learning
 - Mathematics Teaching Practices
 - Standards for Mathematical Practice
- Mathematics Teaching Practices Concentration
 - Establish mathematics goals to focus learning
 - Implement tasks that promote reasoning and problem solving
 - Build procedural fluency from conceptual understanding

² Follow-up support provided by ESC/STEM Math Specialists and peer collaboration

- Support in lesson planning, creating/selecting tasks, analyzing student work
- Classroom observation/feedback of model lesson (prior to November PD session)
- *Taking Action: Implementing the Effective Teaching Practices* book study (ADE hosted)
- Participants conduct AR Math QuEST cohort peer observation/feedback

³ *AR Math QuEST PD: Implementing Ambitious Teaching*

- Participants provide evidence of implementation of MTP/SMP: lesson plans, tasks demonstrating appropriate sequence and varied cognitive demand, student work
- Analyze peer evidence and provide feedback
- Refine lesson and task implementation plan based on peer and specialist feedback

⁴ *AR Math QuEST PD: Going Deeper with Ambitious Teaching*

- Mathematics Teaching Practices Concentration
 - Pose purposeful questions
 - Use and connect mathematical representations
 - Facilitate meaningful mathematics discourse
 - Elicit and use evidence of student thinking
 - Support productive struggle in learning mathematics
- Standards for mathematics practice to support effective teaching practices
- 5 practices for orchestrating productive mathematics instruction

Instructional Facilitator Professional Development

PD for instructional facilitators will be offered during the Fall and Spring beginning initial Year 1. This PD will be required for IF desiring to provide ADE-recognized follow-up support to AR Math QuEST classroom teacher cohorts starting 2020-2021 school year. Training may include:

- *AR Math QuEST PD: Introduction to Ambitious Teaching*
- *AR Math QuEST PD: Coaching Ambitious Teaching*
- Book study on *Everything You Need to Know for Mathematics Coaching*
- Potential TOT for select IF to provide *AR Math QuEST PD* to own district 2020-2021

Administrator Professional Development

AR Math QuEST: Overview of Ambitious Teaching for Administrators will be developed but the timeline/launch is not established. Administrators are encouraged to attend the *AR Math QuEST PD: Introduction to Ambitious Teaching* session with their teachers, especially Day 1.

Research and Resources Supporting AR Math QuEST

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